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EXAMINER

PEZZUTO, HELEN LEE

ART UNIT

PAPER NUMBER

1713

DATE MAILED: 08/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/942,887

Applicant(s)

CALLAHAN ET AL.

Examiner

Helen L. Pezzuto

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 53-104 is/are pending in the application.
- 4a) Of the above claim(s) 92-104 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 53-63, 65-76, 78-80 and 82-91 is/are rejected.
- 7) ☒ Claim(s) 64, 77, 81 is/are objected to.
- 8) ☒ Claim(s) 53-104 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 August 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7/14/03 has been entered.

Election/Restrictions

2. Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 53-91, drawn to an ionic conducting membrane, classified in class 526, subclass 318.2.
- II. Claims 92-104, drawn to a method of producing an ionic conducting membrane, classified in class 524, subclass 832.

The inventions are distinct, each from the other because of the following reasons:

3. Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can

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be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case other process steps such as treating the polymerized membrane with an alkaline solution can produce the membrane product.

4. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

5. During a telephone conversation with Mr. Ralph Crispino on 7/21/03 a provisional election was made without traverse to prosecute the invention of Group I, claims 53-91. Affirmation of this election must be made by applicant in replying to this Office action. Claims 92-104 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

6. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must

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be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Objections

7. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Currently, there are two sets of claim 58 and 59.

Applicant is requested to make the necessary correction.

Specification

On page 18 of the specification, the n value is unclear. Applicant is requested to make the necessary correction.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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9. Claims 73, 77-78 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 73 is currently depended on claim 1, which has been cancelled in paper no. 8.

In claims 77 and 81, the polysulfone (anionic) water-soluble or water-swellaable polymer species is expressed twice in the claims.

Claim Rejections - 35 USC § 102/103

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual

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Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 53, 55, 58, 59, 58, 62-63, 65-76, 85-86, 89-91 are rejected under 35 U.S.C. 102(b) as being anticipated by, in the alternative, under 35 U.S.C. 103(a) as obvious over by Viescou (US-918) (with respect to claims 58, 59, 58, and 74-76).

U.S. 3,871,918 to Viescou discloses a negative electrode of zinc powder suspended in a three-dimensional gel comprising a polymerized product of acrylamide, acrylic acid and methylenebisacrylamide, and KOH electrolyte solution (col. 4, lines 3-20; claim 1). Prior art three-

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dimensional gel containing the electrolyte reads on the presently claimed ionic conducting membrane polymerized in situ on an electrode because it serves as the same function. Furthermore, electrode 6 is rested adjacent to a cylindrical casing 1, made of synthetic material which embraces the presently claimed substrate expressed in claims 89-90. Regarding the membrane thickness and conductivity expressed in claims 58, 59, 58 and 74-76, the examiner is of the position that such properties, though not explicitly shown by US-918, are considered inherent in the prior art because identical elements are used to produce the electrode. The burden is upon the applicant to provide clear evidence that the respective compositions do in fact differ.

13. Claims 52, 55, 85-86, 89, and 91 are rejected under 35 U.S.C. 102(b) as being anticipated by Sun (US-974).

U.S. 5,609,974 to Sun discloses and exemplifies a solid polymer electrolyte derived from polymerizing three monomers together with a lithium salt and plasticizers (col. 2, line 39 to col. 3, line 34. Prior art Lithium salts (see working Examples and Table 2) are well known alkaline metal salts which are conventionally used in electrochemical cells, thus, encompassed the instant ionic

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membrane as claimed. Furthermore, prior art teaches that the solid polymer electrolyte can be formed in situ by spraying the solution consisting of the monomers, salt and plasticizers on the surface of the electrode (col. 3, lines 35-41) which encompasses the instant in situ process expressed in claim 91. Alternatively, the polymerizable mixture can be spread on a solid substrate, resulting in a thin film product (col. 3, lines 42-46; col. 4, example 1), thus meeting the terms expressed in claim 89. Benzoyl peroxide was employed in prior art working examples, thus, meeting the terms in claims 85-86.

14. Claims 53-56, 65-67, 89 and 91 are rejected under 35

U.S.C. 102(b) as being anticipated by Lee et al. (US-758).

U.S. 5,238,758 to Lee et al. discloses a method for forming an interpenetrating polymer network containing a liquid electrolyte for use in solid-state electrochemical cells. Prior art method comprises forming a mixture of an ethylenically unsaturated liquid monomeric, radiation polymerizable compound, a radiation inert ionically conducting liquid, and an ionizable alkaline metal salt, and subjecting the mixture to actinic radiation to produced a crosslinked network (col. 5, lines 10-53; col. 6, lines 26-56). One of prior art embodiment comprises a method for

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forming an anode half element which comprises coating an anodic metal foil member with said mixture to form a solid matrix containing said electrolyte (col.3, lines 49-57; col. 6, lines 57-65), which meets the terms expressed in claims 89 and 91. Furthermore, prior art disclose and exemplify the incorporation of higher molecular weight polyethylene oxide which embraces the instant water-soluble or water-swellaable polymer expressed in claim 54 (col. 5, lines 55-57). Thus, anticipating the instant claims.

15. Claims 53-56, 65-67, 86, 88, 89, 91 are rejected under 35 U.S.C. 102(e) as being anticipated by Kolb et al. (US-282).

U.S. 6,080,282 to Kolb et al. discloses an electrolyte solution comprises a polymerizable electrolyte material and a reinforcement polymer. Prior art polymerizable electrolyte material comprises at least a solvent, a monomer, an initiator, and an ionic conductor which is selected from a suitable alkaline Lithium salt (col. 2, lines 21-46). Prior art further teaches applying the electrolyte solution onto an electrode to form the electrolyte gel. Thus, embraces the terms expressed in claims 89 and 91 (col. 2, lines 47-65). It is noted that prior art monomers (i.e. PHOTOMER 4050, 4158) are within

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the scope of the instant ethylenically unsaturated acids and acid derivatives. Thus, meeting the instant claims.

16. Claims 53, 55, 59-63, 65-73, 85-86 are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Reichert et al. (US-988).

U.S. 5,549,988 to reichert et al. discloses an electrolyte system comprising a polymer matrix derived from crosslinked polyacrylic acid and/or derivatives which is adapted to engaged in electroactive species such as KOH electrolyte (col. 3 lines 7-32; working examples). The presently claimed ionic conducting membrane comprising the polymerization product of one or more ethylenically unsaturated acids and acid derivatives and a crosslinking agent falls within the scope of prior art electrolyte system, in the absence of criticality shown for the recited process step because the final product is identical in both cases, wherein "species replacement" between an alkaline component (i.e. KOH) and the polymer matrix has occurred (col. 3, lines 40-60). The burden is upon applicant to provide clear and convincing factual evidence that the respective products do in fact differ.

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Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

18. Claims 57, 59-61, 65-67, 70-72, 78-80, 82-84, 86, 88 are rejected under 35 U.S.C. 103(a) as being unpatentable over prior art discussed above under 102 and further in light of the following remarks.

The presently claimed amount of ethylenically unsaturated acids and acid derivatives, crosslinking agents, water-soluble or water-swellaable polymer, and initiator may be silent and/or not specially exemplified in some of the references discussed above. The examiner is of the position that it would have been obvious to one skilled in the electrochemical art to determine the optimum proportions of these components within the general disclosures of the references because it has been held that where the general conditions of a claim are disclosed in

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the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

Allowable Subject Matter

19. Claims 64, 77 and 81 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Prior art of record failed to disclose or suggest an ionic conducting membrane expressed in claims 53-54 with the specific ethylenically unsaturated acids/acid derivatives and water-soluble or water-swellaible polymer species expressed in claims 64, 77 and 81.

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

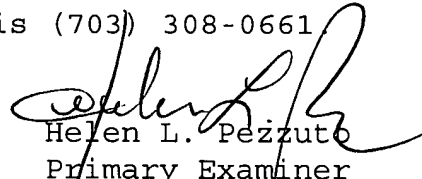
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helen L. Pezzuto whose telephone number is (703) 308-2393. The examiner can normally be reached on 8 AM to 4 PM, Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on (703) 308-2450. The fax phone numbers for the organization where this application or proceeding is assigned

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are (703) 872-9310 for regular communications and (703) 892-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661


Helen L. Pezzuto
Primary Examiner
Art Unit 1713

hlp
July 31, 2003